

WHAT IS CLAIMED IS:

1. A screen printing apparatus for printing on a board using cream solder through pattern holes of a mask plate by performing a squeegeeing operation in which the mask plate is  
5 laid on a board, comprising:

a squeegee moved slidably on a top surface of the mask plate while applying a constant printing pressure to the mask plate;

a printing pressure applying means for applying printing  
10 pressure to the mask plate by pressing the squeegee against the mask plate;

a squeegee moving means for moving the squeegee in a horizontal direction;

a plate separation means for separating the board from  
15 a bottom surface of the mask plate;

a printing control means for performing a printing operation at a prescribed squeegee movement speed and a prescribed printing pressure under prescribed plate release conditions by controlling the printing pressure applying means,  
20 the squeegee moving means, and the plate separation means;

an inspecting means for inspecting a state of charging of the pattern holes with the cream solder and a state of transfer of the cream solder to the board by detecting states of the cream solder on the top surface of the mask plate and on a top surface  
25 of the board;

a print parameter setting processing means for setting print parameters including the squeegee movement speed, the printing pressure, and a plate release speed to proper values on the basis of inspection results of the inspecting means that  
5 are obtained when the print parameters are varied according to prescribed parameter varying patterns that are set for the respective print parameters; and

a print parameter storing means for storing the thus-set print parameters.

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2. The screen printing apparatus according to claim 1, wherein the print parameter setting means sets the squeegee movement speed, the printing pressure, and the plate release conditions in this order.

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3. A screen printing apparatus for printing on a board using cream solder through pattern holes of a mask plate by performing a squeegeeing operation in which the mask plate is laid on a board, comprising:

20 a squeegee moved slidably on a top surface of the mask plate while applying a constant printing pressure to the mask plate;

a printing pressure applying means for applying printing pressure to the mask plate by pressing the squeegee against the  
25 mask plate;

a squeegee moving means for moving the squeegee in a horizontal direction;

a plate separation means for separating the board from a bottom surface of the mask plate;

5 a printing control means for performing a printing operation at a prescribed squeegee movement speed and a prescribed printing pressure under prescribed plate release conditions by controlling the printing pressure applying means, the squeegee moving means, and the plate separation means;

10 a print parameter setting processing means for setting print parameters including the squeegee movement speed, the printing pressure, and a plate release speed to proper values on the basis of inspection results of a state of charging of the pattern holes with the cream solder and a state of transfer  
15 of the cream solder to the board that are obtained when the print parameters are varied;

a print parameter storing means for storing the thus-set print parameters; and

20 a processing procedure display means for displaying a processing procedure in print parameter setting processing of the print parameter setting processing means.

4. The screen printing apparatus according to claim 3, wherein the processing procedure display means displays  
25 processing procedure so that the squeegee movement speed, the

printing pressure, and the plate release conditions are set in this order.

5. A screen printing method for printing on a board  
5 using cream solder through pattern holes of a mask plate by performing a squeegeeing operation in which the mask plate is laid on a board and a squeegee is moved slidngly on the mask plate while the squeegee applies a constant printing pressure to the mask plate, characterized in:

10 that print parameter setting process for setting print parameters including a squeegee movement speed, a printing pressure, and plate release conditions that are specified when a printing operation is performed while a printing control means controls a printing pressure applying means for applying printing  
15 pressure to the mask plate by pressing the squeegee against the mask plate, a squeegee moving means for moving the squeegee in a horizontal direction, and a plate separation means for separating the board from a bottom surface of the mask plate includes a first step of setting a squeegee movement speed at  
20 which the squeegee is to be moved, a second step of setting a printing pressure at which the squeegee is to be pressed against the mask plate, and a third step of setting a plate release speed at which the board is to be separated from the bottom surface of the mask plate;

25 that in the second step a printing pressure for realizing

a desired cream solder charging state is set by performing squeegeeing operations at the squeegee movement speed that was set at the first step while varying the printing pressure according to a prescribed varying pattern and inspecting a state  
5 of charging of the pattern holes with the cream solder at each printing pressure by detecting a state of the cream solder on the mask plate; and

that in the third step plate release conditions for realizing a desired cream solder transfer state are set by  
10 performing a squeegeeing operation at the squeegee movement speed that was set at the first step and at the printing pressure that was set at the second step, and then performing plate separation operations of separating the board from the bottom surface of the mask plate while varying the plate release conditions  
15 according to prescribed varying patterns and inspecting a cream solder transfer state on the board under each set of plate release conditions.

6. The screen printing method according to claim 5,  
20 wherein a fourth step of setting a squeegee movement speed that is higher than the squeegee movement speed that was set at the first step and a fifth step of setting a printing pressure at the squeegee movement speed that was set at the fourth step are executed after the third step; and

25 in the fifth step a printing pressure for realizing a

desired cream solder charging state is set by performing  
squeegeeing operations while varying the printing pressure  
according to a prescribed varying pattern and inspecting a state  
of charging of the pattern holes with the cream solder at each  
5 printing pressure by detecting a state of the cream solder on  
the mask plate.

7. A printing condition setting method for a screen  
printing apparatus which prints cream solder on a board through  
10 pattern holes of a mask plate by performing a squeegeeing  
operation, a squeegee is moved slidngly on a top surface of  
the mask plate while the squeegee is applyied constant printing  
pressure to the mask plate; the setting method comprising:

a first step of setting a squeegee movement speed at  
15 which the squeegee is to be moved;

a second step of setting a printing pressure at which  
the squeegee is to be pressed against the mask plate; and

a third step of setting a plate release speed at which  
the board is to be separated from the bottom surface of the mask  
20 plate,

wherein the second step includes a step of performing  
squeegeeing operations at the squeegee movement speed that was  
set at the first step while varying the printing pressure  
according to a prescribed varying pattern, and a step of  
25 inspecting a state of charging of the pattern holes with the

cream solder at each printing pressure by detecting a state of the cream solder on the mask plate, and

the third step includes a step of performing a squeegeeing operation at the squeegee movement speed that was set at the first step and at the printing pressure that was set at the second step, a step of performing plate separation operations of separating the board from the bottom surface of the mask plate while varying the plate release conditions according to prescribed varying patterns, and a step of inspecting a cream solder transfer state on the board under each set of plate release conditions.

8. The printing condition setting method according to claim 7, wherein a fourth step of setting a squeegee movement speed that is higher than the squeegee movement speed that was set at the first step and a fifth step of setting a printing pressure at the squeegee movement speed that was set at the fourth step are executed after the third step; and

in the fifth step a printing pressure for realizing a desired cream solder charging state is set by performing squeegeeing operations while varying the printing pressure according to a prescribed varying pattern and inspecting a state of charging of the pattern holes with the cream solder at each printing pressure by detecting a state of the cream solder on the mask plate.